

## CLAIMS

a What is claimed is

1. A linear synchronous motor which has the following features:
  - a) at least one primary part (1) and at least one secondary part (6),
  - b) the secondary part (6) has a sequence of poles (10) formed by permanent magnets,
  - c) the length of the secondary part (6) is greater than the length of the primary part (1) in the movement direction (5),
  - d) the primary part (1) has primary part slots (9) which are suitable for holding monophase or polyphase windings,
  - e) the primary part (1) has means which lead to a change in the magnetic force in the movement direction (5) of the linear motor in the region of the end pieces (2) of the primary part (1), and
  - f) the end faces (14) of the end pieces (2) extend perpendicular to the movement direction (5) of the linear motor.
2. The linear synchronous motor as claimed in claim 1, characterized in that the air gap of the end pieces (2) is formed in such a way that a continuous change occurs in the magnetic force in the movement direction (5) of the linear motor in the region of the end pieces (2) of the primary part (1).

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3. The linear synchronous motor as claimed in claim 2, characterized in that the geometry of the parts, facing the air gap, of the end pieces (2) is selected in accordance with the following relationship:

$$y(x) = \delta_0 \left[ \frac{1}{\sqrt{1 - \frac{x}{x_0}} \left[ 1 - \left( \frac{1}{1 + \frac{y_0}{\delta_0}} \right) \right]} - 1 \right]$$

wherein

$\delta_0$  is the magnetically active air gap between the secondary part and the primary part, including the height of the permanent magnets,

$x_0$  is the extent of the part of the end piece in the direction of movement of the linear motor having a non-constant air gap,

$y_0$  is a height of the part of the end piece having a non-constant air gap at  $x_0$  and,

$y(x)$  is the coordinate of the part of the end piece having a non-constant air gap at the point  $x$ .

4. The linear synchronous motor as claimed in <sup>claim 1</sup> ~~one of the preceding claims~~, characterized in that the gaps (13), located between the poles (10), of the secondary part (6) exhibit an angle (20) which differs from 90° with respect to the movement direction (5) of the linear motor.

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a 5. The linear synchronous motor as claimed in <sup>claim 1</sup> ~~one of claims 1, 2 or 3~~, characterized in that the gaps (13) located between the poles (10) have a varying gap width (P).

a 6. The linear synchronous motor as claimed in <sup>claim 1</sup> ~~one of the preceding claims~~, characterized in that the end pieces (2) include at least one partial stack of laminations made of ferromagnetic material and directed essentially perpendicular to the direction of movement (5) of the linear motor.

a 7. The linear synchronous motor as claimed in <sup>claim 1</sup> ~~one of the preceding claims~~, characterized in that the end pieces (2) are configured for attachment onto the primary part (1).

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